CLAIMS:

1. A fuel cell power system comprising:

a plurality of fuel cells electrically coupled with plural terminals and individually configured to convert chemical energy into electricity; and

a digital control system configured to at least one of control and monitor an operation of the fuel cells.

2. The fuel cell power system according to claim 1 wherein the control system is configured to control the operation.

3. The fuel cell power system according to claim 1 wherein the control system is configured to monitor the operation.

4. The fuel cell power system according to claim 1 wherein the fuel cells are coupled in series.

5. The fuel cell power system according to claim 1 wherein the control system comprises a plurality of distributed controllers.

6. The fuel cell power system according to claim 5 wherein the distributed controllers are configured in a master/slave relationship.

7. The fuel cell power system according to claim 1 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.

8. The fuel cell power system according to claim 1 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

9. The fuel cell power system according to claim 8 wherein the fuel cells are individually configured to be physically removable.

10. The fuel cell power system according to claim 8 wherein the fuel cells are individually configured to be electrically bypassed.

11. The fuel cell power system according to claim 1 further comprising a plurality of switching devices configured to selectively shunt respective fuel cells.

12. The fuel cell power system according to claim 11 wherein the control system is configured to monitor at least one electrical characteristic of the fuel cells and to control the switching devices responsive to the monitoring.

13. The fuel cell power system according to claim 1 further comprising:

a housing about the fuel cells;

a temperature sensor within the housing; and

an air temperature control assembly configured to at least one of increase and decrease the temperature in the housing.

14. The fuel cell power system according to claim 13 wherein the control system is configured to monitor temperature using the temperature sensor and to control the air temperature control assembly responsive to the monitoring to maintain the temperature within the housing within a predefined range.

15. The fuel cell power system according to claim 13 wherein the control system is configured to monitor temperature using the temperature sensor and to control the air temperature control assembly responsive to the monitoring to maintain the temperature within the housing within a predefined range of approximately 25 °Celsius to 80 °Celsius.

16. The fuel cell power system according to claim 1 further comprising a fan configured to direct air to the fuel cells, and the control system is configured to control the fan

17. The fuel cell power system according to claim 1 further comprising a plurality of valves configured to supply fuel to respective fuel cells, and the control system is configured to control the valves.

18. The fuel cell power system according to claim 1 further comprising a main valve configured to supply fuel to the fuel cells, and the control system is configured to control the main valve.

19. The fuel cell power system according to claim 1 further comprising a communication port adapted to couple with a remote device, and the control system is configured to communicate with the remote device via the communication port.

20. The fuel cell power system according to claim 19 wherein the shut down operation deactivates one or more of the fuel cells.

21. The fuel cell power system according to claim 19 wherein the shut down operation deactivates all the fuel cells.

22. The fuel cell power system according to claim 1 further comprising a switching device intermediate one of the terminals and the fuel cells, and the control system is configured to control the switching device.

23. The fuel cell power system according to claim 1 further comprising:

a housing about the fuel cells; and

a fuel sensor configured to monitor for the presence of fuel within the housing, and the control system is coupled with the fuel sensor and configured to implement a shut down operation responsive to a detection of fuel within the housing.

24. The fuel cell power system according to claim 1 wherein the fuel cells are provided in a plurality of cartridges.

25. A fuel cell power system comprising:

a housing;

a plurality of terminals;

a plurality of fuel cells within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a plurality of valves adapted to couple with a fuel source and configured to selectively supply fuel to respective fuel cells; and

a control system configured to control the plurality of valves.

26. The fuel cell power system according to claim 25 wherein the control system comprises a plurality of distributed controllers.

27. The fuel cell power system according to claim 25 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.

28. The fuel cell power system according to claim 25 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

29. The fuel cell power system according to claim 28 wherein the fuel cells are individually configured to be physically removable.

30. The fuel cell power system according to claim 28 wherein the fuel cells are individually configured to be electrically bypassed.

31. The fuel cell power system according to claim 25 wherein the control system is configured to monitor at least one electrical characteristic of the fuel cells and to control the respective valves responsive to the monitoring.

SUB A2

32. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a bleed valve configured to selectively purge matter from the at least one fuel cell; and

a control system configured to control selective positioning of the bleed valve.

33. The fuel cell power system according to claim 32 wherein the control system comprises a plurality of distributed controllers.

34. The fuel cell power system according to claim 32 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

35. The fuel cell power system according to claim 32 wherein the at least one fuel cell comprises a plurality of fuel cells.

36. The fuel cell power system according to claim 35 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

37. The fuel cell power system according to claim 32 wherein the control system is configured to periodically open the bleed valve.

38. The fuel cell power system according to claim 32 further comprising a connection arranged to provide drainage from an anode side of the at least one fuel cell to the bleed valve.

39. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a fan within the housing and configured to direct air to the at least one fuel cell; and

a control system configured to control an operation of the fan.

40. The fuel cell power system according to claim 39 wherein the control system comprises a plurality of distributed controllers.

41. The fuel cell power system according to claim 39 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

42. The fuel cell power system according to claim 39 wherein the at least one fuel cell comprises a plurality of fuel cells.

43. The fuel cell power system according to claim 42 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

44. The fuel cell power system according to claim 39 further comprising at least one sensor configured to at least one of monitor current supplied to a load coupled with the terminals and monitor voltage of the at least one fuel cell, and the control system is configured to control a rate of air flow of the fan responsive to the monitoring.

45. The fuel cell power system according to claim 39 wherein the at least one fuel cell includes a cathode side and the fan and the housing are configured to direct air into the cathode side of the at least one fuel cell.

46. The fuel cell power system according to claim 39 further comprising a plenum within the housing and configured to direct air from the fan to the at least one fuel cell.

47. The fuel cell power system according to claim 46 wherein the plenum is configured to direct air to a cathode side of the at least one fuel cell.

48. The fuel cell power system according to claim 39 further comprising an air flow device configured to operate responsive to control from the control system to permit selective passage of air at least one of into and out of the housing.

49. The fuel cell power system according to claim 39 further comprising monitoring circuitry configured to monitor an air flow rate of the fan and output a signal indicative of the air flow rate to the control system.

50. The fuel cell power system according to claim 49 wherein the control system is configured to control an air flow rate of the fan.

SUB A3

51. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a control system configured to at least one of control and monitor an operation of the at least one fuel cell; and

an operator interface coupled with the control system to indicate at least one operational status responsive to control from the control system.

52. The fuel cell power system according to claim 51 wherein the control system comprises a plurality of distributed controllers.

53. The fuel cell power system according to claim 51 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

54. The fuel cell power system according to claim 51 wherein the at least one fuel cell comprises a plurality of fuel cells.

55. The fuel cell power system according to claim 54 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

56. The fuel cell power system according to claim 51 wherein the operator interface is positioned for observation from the exterior of the housing.

57. The fuel cell power system according to claim 51 wherein the operator interface comprises a display configured to emit a human perceptible signal.

58. The fuel cell power system according to claim 51 wherein the operator interface comprises interface switches configured to receive operator inputs.

SUB A4

59. A fuel cell power system comprising:

a plurality of terminals;

at least one fuel cell electrically coupled with the terminals and configured to convert chemical energy into electricity;

a power supply configured to selectively supply electricity; and

a control system configured to monitor at least one operational condition of the power supply.

60. The fuel cell power system according to claim 59 wherein the control system comprises a plurality of distributed controllers.

61. The fuel cell power system according to claim 59 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

62. The fuel cell power system according to claim 59 wherein the at least one fuel cell comprises a plurality of fuel cells.

63. The fuel cell power system according to claim 62 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

64. The fuel cell power system according to claim 59 wherein the power supply supplies electricity to the control system.

65. The fuel cell power system according to claim 59 wherein the power supply includes a battery.

66. The fuel cell power system according to claim 65 further comprising charge circuitry configured to selectively charge the battery responsive to control from the control system.

67. The fuel cell power system according to claim 59 further comprising an operator interface and the control system is configured to control the operator interface to indicate the at least one operational condition.

68. A fuel cell power system comprising:

a plurality of terminals;

at least one fuel cell electrically coupled with the terminals and configured to convert chemical energy into electricity;

a sensor configured to monitor at least one electrical condition of the at least one fuel cell; and

a control system coupled with the sensor and configured to monitor the sensor.

69. The fuel cell power system according to claim 68 wherein the control system comprises a plurality of distributed controllers.

70. The fuel cell power system according to claim 68 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

71. The fuel cell power system according to claim 68 wherein the at least one fuel cell comprises a plurality of fuel cells.

72. The fuel cell power system according to claim 71 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

73. The fuel cell power system according to claim 68 further comprising an operator interface and the control system is configured to control the operator interface to indicate the at least one electrical condition.

74. The fuel cell power system according to claim 68 further comprising a fan configured to direct air to the at least one fuel cell and the control system is configured to control the fan responsive to the at least one electrical condition.

75. A fuel cell power system comprising:

a plurality of terminals;

a plurality of fuel cells electrically coupled with the terminals and configured to convert chemical energy into electricity;

a main valve adapted to couple with a fuel source and configured to selectively supply fuel to the fuel cells; and

a control system configured to control the main valve.

76. The fuel cell power system according to claim 75 wherein the control system comprises a plurality of distributed controllers.

77. The fuel cell power system according to claim 75 wherein the fuel cells comprise polymer electrolyte membrane fuel cells.

78. The fuel cell power system according to claim 75 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

79. The fuel cell power system according to claim 75 further comprising a plurality of auxiliary valves configured to selectively supply fuel to respective fuel cells.

80. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

an air temperature control assembly configured to direct air within the housing to the at least one fuel cell and comprising a modifying element configured to condition the temperature of the air; and

a control system configured to control the modifying element.

81. The fuel cell power system according to claim 80 wherein the control system comprises a plurality of distributed controllers.

82. The fuel cell power system according to claim 80 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

83. The fuel cell power system according to claim 80 wherein the at least one fuel cell comprises a plurality of fuel cells.

84. The fuel cell power system according to claim 83 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

85. The fuel cell power system according to claim 80 further comprising a temperature sensor configured to monitor the temperature of the directed air within the housing.

86. The fuel cell power system according to claim 85 wherein the control system is configured to monitor the temperature of the directed air from the temperature sensor and to control the modifying element responsive to the monitoring of the temperature.

87. The fuel cell power system according to claim 80 wherein the modifying element comprises a heater.

88. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a fuel delivery system configured to supply fuel to the at least one fuel cell;

a fuel sensor positioned within the housing; and

a control system configured to monitor a detection of fuel within the housing using the fuel detection sensor.

89. The fuel cell power system according to claim 88 wherein the control system comprises a plurality of distributed controllers.

90. The fuel cell power system according to claim 88 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

91. The fuel cell power system according to claim 88 wherein the at least one fuel cell comprises a plurality of fuel cells.

92. The fuel cell power system according to claim 91 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

93. The fuel cell power system according to claim 88 further comprising an operator interface and the control system is configured to control the operator interface to indicate a detection of fuel.

94. The fuel cell power system according to claim 88 wherein the fuel sensor comprises a hydrogen gas sensor.

95. The fuel cell power system according to claim 88 wherein the at least one fuel cell comprises a plurality of fuel cells, and the fuel delivery system comprises a plurality of valves configured supply fuel to respective ones of the fuel cells.

96. The fuel cell power system according to claim 95 wherein the control system is configured to selectively close the valves responsive to a detection of fuel using the fuel sensor.

97. The fuel cell power system according to claim 88 further comprising a heater configured to selectively impart heat flux to the fuel sensor.

98. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a temperature sensor within the housing; and

a control system coupled with the temperature sensor and configured to monitor the temperature in the housing using the temperature sensor.

99. The fuel cell power system according to claim 98 wherein the control system comprises a plurality of distributed controllers.

100. The fuel cell power system according to claim 98 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

101. The fuel cell power system according to claim 98 wherein the at least one fuel cell comprises a plurality of fuel cells.

102. The fuel cell power system according to claim 101 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

103. The fuel cell power system according to claim 98 further comprising an air temperature control assembly configured to at least one of increase and decrease the temperature in the housing.

104. The fuel cell power system according to claim 103 wherein the control system is configured to control the air temperature control assembly.

105. The fuel cell power system according to claim 103 wherein the control system is configured to control the air temperature control assembly to maintain the temperature in the housing within a predefined range.

106. The fuel cell power system according to claim 103 wherein the control system is configured to control the air temperature control assembly to maintain the temperature in the housing within a predefined range of approximately 25 °Celsius to 80 °Celsius.

107. The fuel cell power system according to claim 103 wherein the air temperature control assembly comprises:

a fan configured to circulate air within the housing; and

an air flow device configured to permit selective passage of air at least one of into and out of the housing.

108. The fuel cell power system according to claim 107 wherein the control system is configured to control the fan and the air flow device.

109. The fuel cell power system according to claim 98 further comprising a temperature sensor configured to monitor a temperature exterior of the housing.

110. A fuel cell power system comprising:

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

at least one switching device configured to selectively shunt the at least one fuel cell; and

a control system configured to control the at least one switching device.

111. The fuel cell power system according to claim 110 wherein the control system comprises a plurality of distributed controllers.

112. The fuel cell power system according to claim 110 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

113. The fuel cell power system according to claim 110 wherein the at least one fuel cell comprises a plurality of fuel cells.

114. The fuel cell power system according to claim 113 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

115. The fuel cell power system according to claim 110 wherein the control system is configured to shunt the at least one fuel cell for a variable period of time.

116. The fuel cell power system according to claim 110 wherein the at least one fuel cell comprises plural fuel cells and the at least one switching device comprises plural switching devices.

117. The fuel cell power system according to claim 116 wherein the control system is configured to sequentially shunt the fuel cells using the respective switching devices.

118. The fuel cell power system according to claim 116 wherein the control system is configured to shunt individual ones of the fuel cells using the respective switching devices.

119. The fuel cell power system according to claim 116 wherein the control system is configured to shunt the individual ones of the fuel cells according to a specified order.

120. The fuel cell power system according to claim 116 further comprising a plurality of valves individually configured to selectively supply fuel to respective fuel cells, and wherein the control system is configured to control the valves.

121. The fuel cell power system according to claim 120 wherein the control system is configured to cease supply of fuel to shunted fuel cells using respective ones of the valves.

122. The fuel cell power system according to claim 116 wherein the switching devices comprise MOSFET switching devices.

123. A fuel cell power system comprising:

a housing;

a plurality of terminals;

at least one fuel cell within the housing and electrically coupled with the terminals and configured to convert chemical energy into electricity;

a switching device coupled intermediate the at least one fuel cell and one of the terminals; and

a control system coupled with the switching device and configured to control the switching device to selectively couple the terminal with the at least one fuel cell.

124. The fuel cell power system according to claim 123 wherein the control system comprises a plurality of distributed controllers.

125. The fuel cell power system according to claim 123 wherein the at least one fuel cell comprises a plurality of polymer electrolyte membrane fuel cells.

126. The fuel cell power system according to claim 123 wherein the at least one fuel cell comprises a plurality of fuel cells.

127. The fuel cell power system according to claim 126 wherein the fuel cells are configured to be individually selectively deactivated and remaining ones of the fuel cells are configured to provide electricity to the terminals with others of the fuel cells deactivated.

128. The fuel cell power system according to claim 123 wherein the switching device comprises at least one MOSFET switching device.

129. The fuel cell power system according to claim 123 further comprising a temperature sensor positioned within the housing, and the control system is configured to monitor the temperature within the housing and to couple the terminal with the at least one fuel cell using the switching device responsive to the temperature being within a predefined range.

130. A method of controlling a fuel cell power system comprising:

providing a plurality of fuel cells individually configured to convert chemical energy into electricity;

electrically coupling the plurality of fuel cells;

providing a first terminal coupled with the fuel cells;

providing a second terminal coupled with the fuel cells; and

coupling a digital control system with the fuel cells to at least one of monitor and control an operation of the fuel cells.

131. The method according to claim 130 further comprising monitoring the operation of the fuel cells.

132. The method according to claim 130 further comprising controlling the operation of the fuel cells.

133. The method according to claim 130 wherein the coupling the control system comprises coupling a plurality of distributed controllers.

134. The method according to claim 130 wherein the providing the fuel cells comprises providing polymer electrolyte membrane fuel cells.

135. The method according to claim 134 further comprising deactivating at least one of the fuel cells.

136. The method according to claim 135 wherein the deactivating comprises physically removing.

137. The method according to claim 135 wherein the deactivating comprises electrically bypassing.

138. The method according to claim 135 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

139. The method according to claim 130 further comprising selectively shunting at least one of the fuel cells.

140. The method according to claim 130 further comprising:

monitoring at least one electrical characteristic of the fuel cells; and

shunting at least one of the fuel cells responsive to the monitoring.

141. The method according to claim 130 further comprising maintaining an air temperature about the fuel cells in a predefined range.

142. The method according to claim 130 further comprising maintaining an air temperature about the fuel cells in a predefined range of approximately 25 °Celsius to 80 °Celsius.

143. The method according to claim 130 further comprising directing air to the fuel cells using a fan.

144. The method according to claim 143 further comprising:

monitoring a load coupled with the terminals; and

controlling the fan responsive to the monitoring using the control system.

145. The method according to claim 130 further comprising:

supplying fuel to the fuel cells using a plurality of auxiliary valves; and

controlling the auxiliary valves using the control system.

146. The method according to claim 145 further comprising:

supplying fuel to the auxiliary valves using a main valve; and

controlling the main valve using the control system.

147. The method according to claim 130 further comprising:

communicating with a remote device using a communication port; and

controlling the communicating using the control system.

148. The method according to claim 130 further comprising:

switching a connection intermediate one of the terminals and the fuel cells; and

controlling the switching using the control system.

149. The method according to claim 130 further comprising:

monitoring for the presence of fuel within a housing about the fuel cells; and

implementing a shut down operation responsive to the monitoring using the control system.

150. The method according to claim 149 wherein the implementing deactivates one or more of the fuel cells.

151. The method according to claim 149 wherein the implementing deactivates all of the fuel cells.

152. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

supplying fuel to the at least one fuel cell; and

controlling the supplying using a control system.

153. The method according to claim 152 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

154. The method according to claim 152 wherein the providing the at least one fuel cell comprises providing the at least one fuel cell having a plurality of polymer electrolyte membrane fuel cells.

155. The method according to claim 152 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

156. The method according to claim 155 further comprising deactivating at least one of the fuel cells.

157. The method according to claim 156 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

158. The method according to claim 152 further comprising monitoring at least one electrical characteristic of the at least one fuel cell, and the controlling is responsive to the monitoring.

159. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

selectively exhausting a connection coupled with the at least one fuel cell; and

controlling the exhausting using a control system.

160. The method according to claim 159 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

161. The method according to claim 159 wherein the providing the at least one fuel cell comprises providing the at least one fuel cell having a plurality of polymer electrolyte membrane fuel cells.

162. The method according to claim 159 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

163. The method according to claim 162 further comprising deactivating at least one of the fuel cells.

164. The method according to claim 163 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

165. The method according to claim 159 wherein the selectively exhausting comprises periodically exhausting responsive to control of the control system.

166. The method according to claim 159 wherein the exhausting comprises exhausting using a bleed valve.

167. The method according to claim 159 wherein the exhausting comprises exhausting from an anode of the at least one fuel cell.

168. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

directing air to the at least one fuel cell; and

controlling the directing using a control system.

169. The method according to claim 168 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

170. The method according to claim 168 wherein the providing the at least one fuel cell comprises providing the at least one fuel cell having a plurality of polymer electrolyte membrane fuel cells.

171. The method according to claim 168 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

172. The method according to claim 171 further comprising deactivating at least one of the fuel cells.

173. The method according to claim 172 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

174. The method according to claim 168 further comprising providing electricity to a load coupled with the terminals, and the controlling is responsive to the monitoring.

175. The method according to claim 168 further comprising monitoring at least one of voltage of the at least one fuel cell and current passing through the at least one fuel cell, and the controlling is responsive to the monitoring.

176. The method according to claim 168 wherein the directing comprises directing air into a cathode side of the at least on fuel cell.

177. The method according to claim 176 wherein the directing comprises directing using a fan, and the controlling comprises controlling an air flow rate of the fan.

178. The method according to claim 168 further comprising introducing exterior air into a housing about the at least one fuel cell.

179. The method according to claim 168 further comprising monitoring the temperature of the air.

180. The method according to claim 179 further comprising controlling a modifying element using the control system to control the temperature of the air responsive to the monitoring.

181. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

indicating at least one operational status of the fuel cell power system using an operator interface; and

controlling the indicating using a control system.

182. The method according to claim 181 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

183. The method according to claim 181 wherein the providing the at least one fuel cell comprises providing the at least one fuel cell having a plurality of polymer electrolyte membrane fuel cells.

184. The method according to claim 181 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

185. The method according to claim 184 further comprising deactivating at least one of the fuel cells.

186. The method according to claim 185 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

187. The method according to claim 181 wherein the indicating comprises emitting a human perceptible signal.

188. The method according to claim 181 wherein the indicating comprises indicating using a display.

189. The method according to claim 181 further comprising forwarding the at least one operational status to a remote device.

190. The method according to claim 181 further comprising receiving operator inputs using the operator interface.

191. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

supplying electricity using a power supply; and

monitoring at least one electrical condition of the power supply using a control system.

192. The method according to claim 191 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

193. The method according to claim 191 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

194. The method according to claim 191 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

195. The method according to claim 194 further comprising deactivating at least one of the fuel cells.

196. The method according to claim 195 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

197. The method according to claim 191 wherein the supplying comprises supplying electricity to the control system.

198. The method according to claim 191 wherein the supplying comprises supplying power using the power supply comprising a battery.

199. The method according to claim 198 further comprising:

charging the battery; and

controlling the charging using the control system.

200. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell; and

monitoring an electrical condition of the at least one fuel cell using a control system.

201. The method according to claim 200 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

202. The method according to claim 200 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

203. The method according to claim 200 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

204. The method according to claim 203 further comprising deactivating at least one of the fuel cells.

205. The method according to claim 204 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

206. The method according to claim 200 further comprising indicating the electrical condition using an operator interface.

207. The method according to claim 200 further comprising:

directing air to the at least one fuel cell; and

controlling the directing using the control system responsive to the monitoring.

208. The method according to claim 200 further comprising shunting the at least one fuel cell after the monitoring.

209. A method of controlling a fuel cell power system comprising:

providing a plurality of fuel cells individually configured to convert chemical energy into electricity;

providing a first terminal coupled with the fuel cells;

providing a second terminal coupled with the fuel cells;

supplying fuel to the fuel cells; and

controlling the supplying using a control system.

210. The method according to claim 209 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

211. The method according to claim 209 wherein the providing the fuel cells comprises providing a plurality of polymer electrolyte membrane fuel cells.

212. The method according to claim 209 further comprising deactivating at least one of the fuel cells.

213. The method according to claim 212 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

214. The method according to claim 209 wherein the supplying comprises supplying using a main valve.

215. The method according to claim 209 wherein the supplying comprises:

supplying using a main valve; and

supplying using a plurality of auxiliary valves.

216. The method according to claim 215 wherein the controlling comprises controlling the main valve and the auxiliary valves using the control system.

217. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

supplying fuel to the at least one fuel cell; and

monitoring for the presence of fuel within a housing about the at least one fuel cell using a control system.

218. The method according to claim 217 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

219. The method according to claim 217 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

220. The method according to claim 217 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

221. The method according to claim 220 further comprising deactivating at least one of the fuel cells.

222. The method according to claim 221 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

223. The method according to claim 217 further comprising:

coupling an operator interface with the control system; and

controlling the operator interface using the control system to indicate the presence of fuel within the housing.

224. The method according to claim 217 further comprising:

selectively ceasing the supplying responsive to the monitoring; and

controlling the ceasing using the control system.

225. The method according to claim 217 wherein the monitoring comprises monitoring using a fuel sensor.

226. The method according to claim 225 further comprising heating the fuel sensor.

227. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell; and

monitoring a temperature within a housing about the at least one fuel cell using a control system.

228. The method according to claim 227 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

229. The method according to claim 227 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

230. The method according to claim 227 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

231. The method according to claim 230 further comprising deactivating at least one of the fuel cells.

232. The method according to claim 231 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

233. The method according to claim 227 further comprising selectively one of increasing and decreasing the temperature in the housing using an air temperature control assembly.

234. The method according to claim 233 further comprising controlling the air temperature control assembly using the control system and responsive to the monitoring.

235. The method according to claim 234 wherein the controlling comprises controlling to maintain the temperature in the housing within a predefined range.

236. The method according to claim 234 wherein the controlling comprises controlling to maintain the temperature in the housing within a predefined range of approximately 25 °Celsius and 80 °Celsius.

237. The method according to claim 227 further comprising:

directing air to the at least one fuel cell; and

controlling the directing using the control system and responsive to the monitoring.

238. The method according to claim 227 further comprising:

inputting exterior air into the housing; and

controlling the inputting using the control system and responsive to the monitoring.

239. The method according to claim 227 further comprising monitoring a temperature exterior of the housing.

240. The method according to claim 227 wherein the monitoring comprises monitoring using a temperature sensor.

241. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

shunting the at least one fuel cell; and

controlling the shunting using a control system.

242. The method according to claim 241 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

243. The method according to claim 241 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

244. The method according to claim 241 further comprising varying a period of time of the shunting using the control system.

245. The method according to claim 241 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

246. The method according to claim 245 further comprising deactivating at least one of the fuel cells.

247. The method according to claim 246 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

248. The method according to claim 245 further comprising sequentially shunting the fuel cells.

249. The method according to claim 245 further comprising shunting individual ones of the fuel cells.

250. The method according to claim 245 further comprising shunting the fuel cells according to a specified order.

251. The method according to claim 245 further comprising:

supplying fuel to the fuel cells; and

ceasing the supplying to shunted fuel cells.

252. A method of controlling a fuel cell power system comprising:

providing at least one fuel cell configured to convert chemical energy into electricity;

providing a first terminal coupled with the at least one fuel cell;

providing a second terminal coupled with the at least one fuel cell;

switching a connection immediate one of the terminals and the at least one fuel cell; and

controlling the switching using a control system.

253. The method according to claim 252 wherein the controlling comprises controlling using the control system comprising a plurality of distributed controllers.

254. The method according to claim 252 wherein the providing the at least one fuel cell comprises providing the fuel cell having a plurality of polymer electrolyte membrane fuel cells.

255. The method according to claim 252 wherein the providing the at least one fuel cell comprises providing a plurality of fuel cells.

256. The method according to claim 255 further comprising deactivating at least one of the fuel cells.

257. The method according to claim 256 further comprising providing electricity to a load coupled with the terminals with the at least one fuel cell deactivated.

258. The method according to claim 252 further comprising monitoring a temperature within a housing about the at least one fuel cell and the controlling is responsive to the monitoring.

259. A method of operating a fuel cell power system comprising:

initiating a start-up procedure;

monitoring the temperature within a housing containing at least one fuel cell;

selectively adjusting the temperature within the housing using a modifying element responsive to the monitoring; and

coupling a power bus with a terminal responsive to the monitoring.

260. The method according to claim 259 further comprising monitoring for the presence of fuel.

261. The method according to claim 259 further comprising: shunting the at least one fuel cell according to a duty cycle; and selectively setting the duty cycle to maximum.

262. The method according to claim 259 wherein the adjusting comprises heating using the modifying element to increase the temperature.